

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A cardiac stimulus device lead, comprising:
a first conductor connected to a multiplexer switch, the multiplexer switch including a first terminal connected to a first electrode and a second terminal connected to a sensing circuit;
a second conductor connected to a second electrode; and
a controller connected to the multiplexer switch,
wherein the controller is adapted to control the switch to selectively connect the first terminal to and disconnect the second terminal from the first conductor to ~~one of~~ electrically connect the first electrode to and electrically disconnect the sensing circuit from the first conductor, and to control the switch to connect the second terminal to and disconnect the first terminal from the first conductor to electrically connect the sensing circuit to and electrically disconnect the first electrode from the first conductor.
2. (Original) The cardiac stimulus device lead of claim 1, wherein the controller is adapted to selectively connect the first conductor to the first electrode during a pacing pulse on the first conductor.
3. (Original) The cardiac stimulus device lead of claim 2, wherein the controller is adapted to selectively connect the first conductor to the sensing circuit after the pacing pulse.
4. (Original) The cardiac stimulus device lead of claim 3, wherein the controller is adapted to selectively connect the first conductor to the first electrode during an active discharge pulse, and the controller is adapted to selectively connect the first conductor to the sensing circuit after the pacing pulse and before the active discharge pulse.
5. (Original) The cardiac stimulus device lead of claim 1, further comprising a capacitor selectively coupled between the first conductor and the second conductor for storing a charge from an electrical pulse.

6. (Original) The cardiac stimulus device lead of claim 5, wherein the controller is coupled to the capacitor for being powered by the charge stored thereon.

7. (Original) The cardiac stimulus device lead of claim 6, wherein the controller is adapted for providing a control signal to selectively couple the capacitor between the first conductor and the second conductor.

8. (Original) The cardiac stimulus device lead of claim 6, wherein the sensing circuit is selectively coupled to the capacitor for being powered by the charge stored thereon.

9. (Original) The cardiac stimulus device lead of claim 8, wherein the controller is adapted to provide a control signal to selectively couple the sensing circuit to the capacitor.

10. (Original) The cardiac stimulus device lead of claim 1, wherein the sensing circuit includes a sensor.

11. (Original) The cardiac stimulus device lead of claim 1, wherein the sensing circuit is a micro-electromechanical system.

12. (Original) The cardiac stimulus device lead of claim 1, wherein the sensing circuit is adapted to sense biochemicals.

13. (Original) The cardiac stimulus device lead of claim 1, wherein the sensing circuit is adapted to sense oxygen.

14. (Original) The cardiac stimulus device lead of claim 1, wherein the sensing circuit is adapted to sense carbon dioxide.

15. (Original) The cardiac stimulus device lead of claim 1, wherein the sensing circuit is adapted to sense catecholamines.

16. (Original) The cardiac stimulus device lead of claim 1, wherein the sensing circuit is adapted to sense temperature.

17. (Original) The cardiac stimulus device lead of claim 1, wherein the sensing circuit is adapted to sense pressure.

18. (Original) The cardiac stimulus device lead of claim 1, wherein the controller includes sensor circuit (SC) control circuitry adapted to control the sensing circuit.

19. (Currently Amended) The cardiac stimulus device lead of claim 1, further comprising a capacitor selectively coupled between the first conductor and the second conductor for storing a charge from an electrical pulse, wherein the controller includes capacitor coupling control circuitry adapted to selectively couple ~~[[a]]~~ the capacitor between the first conductor and the second conductor.

20. (Original) The cardiac stimulus device lead of claim 19, wherein the capacitor coupling control circuitry is adapted to provide a control signal to actuate a switch disposed between the first conductor and the capacitor.

21. (Original) The cardiac stimulus device lead of claim 1, wherein the controller includes sensing circuit (SC) output control circuitry adapted to selectively couple the first conductor to either an output of the sensing circuit or to the first electrode.

22. (Original) The cardiac stimulus device lead of claim 21, wherein the SC output control circuitry is adapted to provide a control signal to actuate the multiplexer switch.

23. (Original) The cardiac stimulus device lead of claim 1, wherein the controller includes sensing circuit (SC) power coupling circuitry to selectively couple a power input of the sensing circuit to a capacitor to provide power to the sensing circuit from the charge stored on the capacitor.

24. (Original) The cardiac stimulus device lead of claim 23, wherein the SC power coupling circuitry is adapted to provide a control signal to actuate a switch disposed between the power input of the SC power coupling circuitry and the capacitor.

25. (Original) The cardiac stimulus device lead of claim 1, wherein the controller includes a timer to time at least one control signal to selectively connect the first conductor to one of the first electrode and the sensing circuit.

26. (Original) The cardiac stimulus device of claim 25, wherein the controller is adapted to sense an electrical pulse, and the timer is adapted to time the at least one control signal to selectively connect the first conductor to the sensing circuit after the electrical pulse.

27. (Original) The cardiac stimulus device lead of claim 25, wherein the controller is adapted to sense a pacing pulse, and the timer is adapted to time the at least one control signal to selectively connect the first conductor to the sensing circuit after the pacing pulse.

28. (Original) The cardiac stimulus device lead of claim 27, wherein the timer is further adapted to time the at least one control signal to selectively connect the first conductor to the sensing circuit before an active discharge pulse for a pacing cycle that includes the pacing pulse.

29. (Original) The cardiac stimulus device lead of claim 1, wherein the second conductor is coupled to a second electrode located on the lead.

30. (Original) The cardiac stimulus device lead of claim 1, wherein the second conductor is coupled to a conductive surface on the pulse generator.

31. (Original) The cardiac stimulus device lead of claim 1, further comprising:

a capacitor;

a first switch adapted to selectively couple the capacitor between the first conductor and the second conductor to store a charge on the capacitor from a pacing pulse; and

a second switch adapted to selectively couple a power input of the sensing circuit to the capacitor to provide power from the charge stored thereon,

wherein the multiplexer switch is adapted to selectively couple the first conductor either to the first electrode or to the output of the sensing circuit,

wherein the controller is coupled to the capacitor to provide power from the charge stored thereon and is coupled to the control input of the sensing circuit, and

wherein the controller is adapted to control the sensing circuit and to selectively actuate the first switch, the second switch and the multiplexer switch.

32. (Original) The cardiac stimulus device lead of claim 31, wherein the controller is adapted to control the sensing circuitry to process and output sensor data after a pacing pulse and before an active discharge pulse.

33. (Original) The cardiac stimulus device lead of claim 32, wherein the controller is adapted for opening the first switch and closing the second switch to process sensor data, and for further actuating the multiplexer switch to couple with the sensor circuit output to output the sensor data.

34. (Original) The cardiac stimulus device lead of claim 33, wherein the controller is adapted for opening the second switch and actuating the multiplexer switch to couple with the first electrode prior to initiating the active discharge pulse.

35. (Currently Amended) A cardiac stimulus device, comprising:

a pulse generator having a standard header; and

at least one lead for coupling to the standard header, wherein the lead includes:

a first conductor connected to a multiplexer switch, the multiplexer switch including a first terminal connected to a first electrode and a second terminal connected to a sensing circuit; a second conductor connected to a second electrode; and a controller connected to the multiplexer switch, wherein the controller is adapted to control the switch to selectively connect the first terminal to and disconnect the second terminal from the first conductor to ~~one of~~ electrically connect the first electrode to and electrically disconnect the sensing circuit from the first conductor, and to control the switch to connect the second terminal to and disconnect the first terminal from the first conductor to electrically connect the sensing circuit to and electrically disconnect the first electrode from the first conductor.

36. (Original) The cardiac stimulus device of claim 35, wherein the sensing circuit is a micro-electromechanical system.

37. (Original) The cardiac stimulus device of claim 35, wherein the sensing circuit is adapted to sense biochemicals.

38. (Original) The cardiac stimulus device of claim 35, wherein the sensing circuit is adapted to sense oxygen.

39. (Original) The cardiac stimulus device of claim 35, wherein the sensing circuit is adapted to sense carbon dioxide.

40. (Original) The cardiac stimulus device of claim 35, wherein the sensing circuit is adapted to sense catecholamines.

41. (Original) The cardiac stimulus device of claim 35, wherein the sensing circuit is adapted to sense temperature.

42. (Original) The cardiac stimulus device of claim 35, wherein the sensing circuit is adapted to sense pressure.

43. (Original) The cardiac stimulus device of claim 35, wherein the pulse generator includes a circuit for generating the electrical pulse, a circuit for sensing intrinsic electrical cardiac signals, and a circuit for receiving sensor data from the sensing circuit.

44. (Original) The cardiac stimulus device of claim 43, wherein the pulse generator includes a communications circuit for communicating with a programmer, and wherein the programmer is adapted for retrieving data from the pulse generator, including sensor data from the sensing circuit.

45-66. (Canceled)

67. (Currently Amended) A method of forming a cardiac stimulus device lead, comprising:
providing a first conductor;
providing a second conductor;
providing a multiplexer switch with a first and second terminal;
providing a sensing circuit;
providing a first electrode;
providing a second electrode;
coupling the first conductor to the multiplexer switch, the switch being adapted to connect the first terminal to and disconnect the second terminal from the first conductor, and to connect the second terminal to and disconnect the first terminal from the first conductor;
coupling the first terminal of the multiplexer switch to the first electrode;
coupling the second terminal of the multiplexer switch to the sensing circuit;
coupling the second conductor to the second electrode; and

providing a controller coupled to and adapted to selectively control the multiplexer switch to switch between electrically connecting ~~connect the first conductor to one of the first electrode to and electrically disconnecting and~~ the sensing circuit ~~from the first conductor, and electrically connecting the sensing circuit to and electrically disconnecting the first electrode from the first conductor~~ ; and
coupling the controller to the multiplexer switch.

68. (New) The method of claim 67, wherein providing a controller includes providing a timer to time at least one control signal to selectively connect the first conductor to one of the first electrode and the sensing circuit, the controller being adapted to sense an electrical pulse, and the timer being adapted to time the at least one control signal to selectively connect the first conductor to the sensing circuit after the electrical pulse.

69. (New) The method of claim 68, wherein the controller is adapted to sense a pacing pulse, and the timer is adapted to time the at least one control signal to selectively connect the first conductor to the sensing circuit after the pacing pulse.

70. (New) The method of claim 69, wherein the timer is further adapted to time the at least one control signal to selectively connect the first conductor to the sensing circuit before an active discharge pulse for a pacing cycle that includes the pacing pulse.

71. (New) The method of claim 68, further comprising:

providing a capacitor;
connecting a first switch to selectively couple the capacitor between the first conductor and the second conductor to store a charge on the capacitor from a pacing pulse;
connecting a second switch to selectively couple a power input of the sensing circuit to the capacitor to provide power from the charge stored thereon; and
coupling the controller to the capacitor to provide power from the charge stored thereon and to the control input of the sensing circuit, wherein the controller is adapted to control the

sensing circuit and to selectively actuate the first switch, the second switch and the multiplexer switch.

72. (New) A cardiac stimulus device lead, comprising:

- a first conductor connected to a multiplexer switch, the multiplexer switch including a first terminal connected to a first electrode and a second terminal connected to a sensing circuit;
- a second conductor connected to a second electrode; and
- a controller connected to the multiplexer switch,

wherein the controller is adapted to selectively connect the first conductor to one of the first electrode and the sensing circuit, and further is adapted to selectively connect the first conductor to the first electrode during a pacing pulse on the first conductor.

73. (New) The cardiac stimulus device lead of claim 72, wherein the controller is adapted to selectively connect the first conductor to the sensing circuit after the pacing pulse.

74. (New) The cardiac stimulus device lead of claim 73, wherein the controller is adapted to selectively connect the first conductor to the first electrode during an active discharge pulse, and the controller is adapted to selectively connect the first conductor to the sensing circuit after the pacing pulse and before the active discharge pulse.

75. (New) A cardiac stimulus device lead, comprising:

- a first conductor connected to a multiplexer switch, the multiplexer switch including a first terminal connected to a first electrode and a second terminal connected to a sensing circuit;
- a second conductor connected to a second electrode;

- a controller connected to the multiplexer switch, wherein the controller is adapted to selectively connect the first conductor to one of the first electrode and the sensing circuit; and

- a capacitor selectively coupled between the first conductor and the second conductor for storing a charge from an electrical pulse.

76. (New) The cardiac stimulus device lead of claim 75, wherein the controller is coupled to the capacitor for being powered by the charge stored thereon.

77. (New) The cardiac stimulus device lead of claim 76, wherein the controller is adapted for providing a control signal to selectively couple the capacitor between the first conductor and the second conductor.

78. (New) The cardiac stimulus device lead of claim 76, wherein the sensing circuit is selectively coupled to the capacitor for being powered by the charge stored thereon.

79. (New) The cardiac stimulus device lead of claim 78, wherein the controller is adapted to provide a control signal to selectively couple the sensing circuit to the capacitor.

80. (New) A cardiac stimulus device lead, comprising:

- a first conductor connected to a multiplexer switch, the multiplexer switch including a first terminal connected to a first electrode and a second terminal connected to a sensing circuit;

- a second conductor connected to a second electrode; and

- a controller connected to the multiplexer switch, wherein the controller is adapted to selectively connect the first conductor to one of the first electrode and the sensing circuit, the controller including a timer to time at least one control signal to selectively connect the first conductor to one of the first electrode and the sensing circuit, wherein the controller is adapted to sense an electrical pulse, and the timer is adapted to time the at least one control signal to selectively connect the first conductor to the sensing circuit after the electrical pulse.

81. (New) The cardiac stimulus device lead of claim 80, wherein the controller is adapted to sense a pacing pulse, and the timer is adapted to time the at least one control signal to selectively connect the first conductor to the sensing circuit after the pacing pulse.

82. (New) The cardiac stimulus device lead of claim 81, wherein the timer is further adapted to time the at least one control signal to selectively connect the first conductor to the sensing circuit before an active discharge pulse for a pacing cycle that includes the pacing pulse.

83. (New) A cardiac stimulus device lead, comprising:

- a first conductor connected to a multiplexer switch, the multiplexer switch including a first terminal connected to a first electrode and a second terminal connected to a sensing circuit;

- a second conductor connected to a second electrode;

- a controller connected to the multiplexer switch;

- a capacitor;

- a first switch adapted to selectively couple the capacitor between the first conductor and the second conductor to store a charge on the capacitor from a pacing pulse; and

- a second switch adapted to selectively couple a power input of the sensing circuit to the capacitor to provide power from the charge stored thereon,

- wherein the controller is adapted to selectively connect the first conductor to one of the first electrode and the sensing circuit and the multiplexer switch is adapted to selectively couple the first conductor either to the first electrode or to the output of the sensing circuit,

- wherein the controller is coupled to the capacitor to provide power from the charge stored thereon and is coupled to the control input of the sensing circuit, and

- wherein the controller is adapted to control the sensing circuit and to selectively actuate the first switch, the second switch and the multiplexer switch.

84. (New) The cardiac stimulus device lead of claim 83, wherein the controller is adapted to control the sensing circuitry to process and output sensor data after a pacing pulse and before an active discharge pulse.

85. (New) The cardiac stimulus device lead of claim 84, wherein the controller is adapted for opening the first switch and closing the second switch to process sensor data, and for further actuating the multiplexer switch to couple with the sensor circuit output to output the sensor data.

86. (New) The cardiac stimulus device lead of claim 85, wherein the controller is adapted for opening the second switch and actuating the multiplexer switch to couple with the first electrode prior to initiating the active discharge pulse.